objects which it contains, while the interest and curiosity of the young pupil are further secured by a good drawing of a spider and his web, as well as by an excellent picture of a pair of boots.

This part of the book deals, then, as the author says, solely with ideas of comparison, measurement and counting. The extent to which we get in part i. may be inferred from the last two questions or problems in it:—

"A book cost 3 dimes, a pencil 3 cents, and a blank book 3 nickels. How many cents did all three cost? Count from 1 to 30; from 5 to 100 by fives. Count as high as you can by hundreds."

Part ii. treats of the elementary operations—addition, subtraction, multiplication, division—and the meaning of fractions (halves, thirds, quarters, &c.) is gradually unfolded during these operations. The pictorial method is continued in this part, but the pictures are of the geometrical kinds that we get by cutting out and folding paper, so that the measurement of simple areas and the nature of an angle are explained to the little learner. Thus, one of the things here learnt by folding is that the sum of the angles of every triangle is two right angles. Near the end of this part, the nature of a decimal is explained, and the extent to which the pupil has progressed may be seen by the following, taken from the last lesson in part ii.:—

"At the rate of 56 miles per hour, how far will a train travel in 5·6 hours? A bookseller paid $\$9\frac{3}{4}$ for books. How many did he buy if each cost $\$\frac{3}{8}$?"

Part iii. treats of "elementary operations classified," that is, the operations of part ii. are treated more in detail and the philosophy of the subject is expounded. Near the end, the nature of ratio and proportion is explained, instruments, such as a two-foot rule, being employed. Among the terminal problems in this part are the following:—

"Express 9 cu. yd. as a decimal of a cord" (from which we conclude that the author does not anticipate an early introduction of a thorough-going metric system into America); "what is the sum of $\frac{2}{3}$, $\frac{3}{5}$, $\frac{5}{7}$ and $\frac{7}{9}$? The rate of taxation of a city is $1\frac{1}{2}\%$. What tax must a citizen pay whose property is assessed at $4500?"

There are no answers supplied to any of the questions (except in two or three instances) throughout the book; it is, as we have said, a guide to the teacher; the young pupils for whose instruction it is intended are not yet *students*.

Of course, the American coinage, with which the questions deal, would require alterations to render the book suitable to English use; but there is no doubt that the author has very skilfully conceived the nature of an effective process of teaching young children, and we think that the exact following of his course and method would prove to be productive of excellent results.

OUR BOOK SHELF.

The Trees, Shrubs and Woody Climbers of the Bombay Presidency. By W. A. Talbot, F.L.S. Second Edition. Pp. xxv + 385. (Bombay, 1902.)

WHEN Sir Joseph Hooker's "Flora of British India," now completed, was undertaken, one of its main objects was stated to be to furnish a basis on which local floras could be constructed. India is so vast, its climatic features are so varied, the economic requirements of its several provinces so diverse, that a general work like that of Hooker needs to be supplemented by local floras in which the special requirements of particular districts can be fulfilled. There is gratifying evidence to show that these requirements are in course of being supplied. There is, for instance, the "Forest Flora of the North-West," by Sir Dietrich Brandis; Sir George King is engaged on the "Flora of the Malay Peninsula"; the "Flora of Ceylon" was completed by the late Dr. Trimen; and General Collett's book on the plants of the Simla district has just been published. We might cite many similar works from the pens of Prain, Clarke, Duthie, Watt, Kurz and others, but enough has been said to show that Sir Joseph Hooker's aim is in process of fulfilment, and that the splendid botanical heritage handed down to us by Roxburgh, Wallich, Wight, Griffith and others is in no danger of being squandered, but is being utilised and extended by the labours of the present race of botanists. When we bring to mind the fact that instruction in botany, at any rate in systematic botany, no longer forms part of the curriculum in the education of medical students, and that complaints have been made as to the lack of interest felt in the subject by the majority of forest officers, this evidence of substantial progress may at least be adduced as a set-off.

The work before us is another instance of the same kind. In form it is modelled upon Hooker's "Flora," in substance it contains a "fairly correct" list of the indigenous ligneous vegetation of the Presidency, together with additional matter relating to distribution, bark, woods and economic products, along with a large number of vernacular names.

The book is in its second edition, and hopes are thrown out that the "next edition" will expand into a handy Bombay forest flora. Actual use in the field or forest, or even in the herbarium, is needed to enable the reviewer to form a complete estimate of the value of such a work. It must suffice to say that the author's method is good, and that it bears the impress of care and accuracy in its production.

La Géologie générale. By Stanislas Meunier, Professeur de Géologie au Muséum d'Histoire Naturelle. Pp. vi + 336; 42 woodcuts. (Paris: Alcan, 1903.) Price 6 francs.

IN this volume, Prof. Stanislas Meunier undertakes, for the International Scientific Library, a presentation of those branches of geological science not already dealt with in his "Experimental Geology" and his "Comparative Geology," published in the same series.

In the introduction to the book, the author defines the ideas which have successively dominated geological theory during the nineteenth century as (1) the cataclysmal views of Cuvier; (2) the uniformitarianism of Lyell; (3) the "actualism" of Constant Prévost; and (4) the "activism," which he regards as the distinctive feature of modern geological thought.

In conformity with this latter point of view, the author then proceeds to discuss the three great causes of change in the earth's crust, namely, the central heat of the globe, the effects of pressure and the influence of the sun's heat. Pursuing this deductive, rather than inductive, mode of treating his subject, the questions next considered are the flexible earth's crust, volcanoes, the action of subterranean and superficial waters, the sea, glaciers, the atmosphere, and vital action. In dealing with each of these subjects, the originality of the author is everywhere manifest, the examples and illustrations chosen being, for the most part, new, and often of a very striking character.

In the second part of the work, which is entitled "Comparative Physiology of Successive Geological Epochs," the effect of the several agencies enumerated

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during past geological periods is traced, and here we have to notice the same freedom from the stereotyped methods and matter of text-books of geology which we have remarked upon in the earlier portions of the work. Subjects like the cause of the formation of concretionary structures in rocks are treated at considerable length and with much skill, though, it must be confessed, with considerable inequality. On the other hand, many important questions which do not happen to have been made the subject of special research by the author are treated in a superficial manner or altogether passed over, there being little obvious connection between the space devoted to various divisions of the subject and their relative importance.

As a work designed to attract the attention of a general reader and to stimulate the thought of more advanced students, the work is excellent. But it is rather as a supplement to other books on the subject than as an independent treatise that its value is most apparent, for it is wanting in many of those features which are necessary in a work which is designed to give a presentation of the present state of geological knowledge. It is unfortunate that the book is not provided with an index.

The Student's Handbook to the University and Colleges of Cambridge. First Edition, Corrected to June 30, 1902. Pp. 468. (Cambridge: University Press, 1902.) Price 3*s.* net.

IN this volume, the editor has brought together in a concise form all the more interesting facts and methods of procedure which every student should desire to know as he proceeds to the University of Cambridge as an undergraduate. There are twenty-three chapters in all, and each is devoted to special items.

After a short and condensed account of the history of each college, with a list of the officials at present in residence, the reader is made acquainted with the conditions of admission to any particular college, the period of residence, discipline, and an excellent survey of the average expenditure necessary.

The next four chapters are devoted to the details of the conditions and value of the entrance scholarships, exhibitions and sizarships, and the various University and college scholarships and prizes, concluding with a general account of the objects for which the several institutions of the University are utilised.

The handbook then gives useful information on the work of teaching as divided between the University and the different colleges, and then proceeds to bring together all the necessary information for those who are about to qualify for the previous, ordinary B.A. degree, and honours examinations.

After two brief chapters on advanced study and research and examinations for medical students, detailed information is given on the subjects of the B.A. and superior degrees, diplomas and fellowships, followed by useful chapters for candidates for Holy Orders, for the Civil Service and Army, and for teachers.

The final chapters show the facilities for the education of women in the University, an account of the more important outside examinations conducted by the University, concluding with a description of the object and work of the scholastic agency and the Appointments Board.

Bacteriological Technique and Special Bacteriology. By Thomas Bowhill, F.R.C.V.S. Second Edition. Pp. xvi + 324. (Edinburgh: Oliver and Boyd, 1902.) Price 21*s.* net.

AS might have been anticipated, a second edition of Prof. Bowhill's book has been rendered necessary by the rapid sale of the first edition.

The book is divided into seven parts, as follows:—Part i., principles of bacteriological technique; part ii., the preparation of nutrient media; part iii., special bacteriology; part iv., the Hyphomycetes; part v., the Blastomycetes; part vi., the Protozoa; part vii., diseases due to undetermined infective agents. The illustrations number 136 and they are all of the highest class. In particular, the photomicrographs, executed by the author and reproduced by the collotype process, are admirable.

The author has the advantage of being, not only a bacteriologist of high repute, but also an acknowledged veterinary expert. It is not surprising, therefore, to find that the diseases of microbial origin, which affect the lower animals as well as human beings, are dealt with in a conspicuously able fashion.

The descriptions of swine fever, swine plague, swine erysipelas, pleuro-pneumonia, contagiosa bovis, broncho-pneumonia bovis, grouse disease, diphtheria and glanders are excellent.

The author has added much new matter to the text, and the book is thoroughly up to date.

Part vii., dealing with diseases due to infective agents of undetermined character, is a specially useful article. As regards rinderpest, the author gives a graphic account of the methods adopted during the recent outbreak of the disease in South Africa. The methods were as follows:—(1) Koch's original bile method; (2) glycerinated bile method (Edington); (3) serum method of Turner and Kolle; (4) defibrinated blood method. Lucid descriptions are given of the best way of preparing the serum, bile and defibrinated blood.

The methods of examining air, water, soil, unsound meat and ice cream are insufficiently discussed, and the bacteriological examination of sewage is apparently not considered at all.

In conclusion, it may be said that no student in veterinary, medical and sanitary science should be without a copy of this excellent manual. That the book will enhance the enviable reputation of the author is beyond question.

Practical Electricity. By J. Hope Belcher. Pp. xi + 165. (London: Allman and Son, Ltd., 1902.) Price 2*s.* 6*d.*

THIS book is intended to be an elementary manual for a laboratory course in practical electricity. It contains instructions for carrying out a number of experiments designed to illustrate the principles of magnetism and electricity. The course is largely modelled on that given by Prof. Ayrton at the City and Guilds Institute. The experiments are well chosen, and the description and instructions seem to us adequate. The student is shown how to tabulate and set out his results, and some useful hints are given to teachers of elementary science as to the conduct of a laboratory class. We notice in one of the experiments the old fallacy of "proving" Ohm's law by a method in which P.D.'s are measured with an electromagnetic voltmeter; it is remarkable how hard this fallacy is to kill. Apart from this and a few minor blemishes, Mr. Belcher's book is a useful little manual.

M. S.

Acht Vorträge über physikalische Chemie. Von J. H. van 't Hoff. Pp. 81. (Braunschweig: Vieweg und Sohn, 1902.) Price 2 Mk. 50 Pf.

PROF. VAN 'T HOFF delivered these lectures in June, 1901, on the invitation of the University of Chicago. As they were intended for a mixed audience, they have a more or less popular character, but in places they would be difficult for anyone lacking special knowledge to follow, without the personal influence of the lecturer. Two lectures each are devoted to the influence exerted by physical chemistry on pure chemistry, technical chemistry, physiology and geology. The treatment is necessarily meagre, but many interesting subjects are touched upon, and to students of science these lectures must prove stimulating and suggestive to a degree.

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